

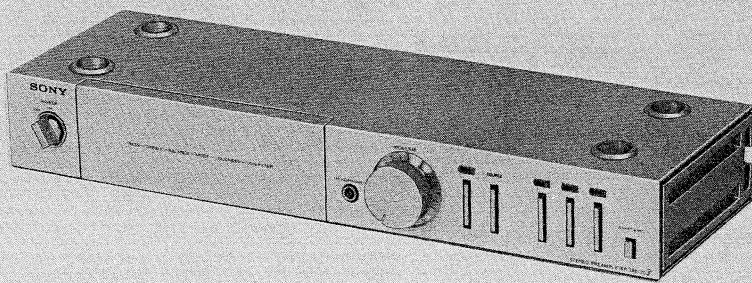
# TAE-20F/20FB

TAE-20F (Panel : silver)

US Model  
AEP Model  
E Model  
UK Model

TAE-20FB (Panel : black)

Canadian Model  
AEP Model



## STEREO PREAMPLIFIER

### SPECIFICATIONS

#### GENERAL

Power Requirements:	120 V ac, 60 Hz (US, Canadian model) 220 V ac (or 240 V ac adjustable by authorized Sony personnel), 50/60 Hz (AEP model)
	120, 220 or 240 V ac adjustable, 50/60 Hz (E model)
	240 V ac (or 220 V ac adjustable by authorized Sony personnel), 50 Hz (UK model)
Power Consumption:	10 W
AC Outlets:	4 switched, total 450 W 1 unswitched, 100 W (US, Canadian model) 2 switched, total 450 W (AEP (Up to Serial No. 550,000), E model) 2 unswitched, total 250 W 2 switched, total 300 W } (UK model)
Dimensions:	Approx. 430 (w) x 70 (h) x 160 (d) mm 17 (w) x 2 3/4 (h) x 6 1/8 (d) inches including projecting parts and controls
Weight:	Approx. 2.7 kg, 6 lb net

— continued on next page —

#### SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY SHADING AND MARK  ON THE SCHEMATIC DIAGRAMS, EXPLODED VIEWS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

ATTENTION AU COMPOSANT AYANT RAPPORT  
À LA SÉCURITÉ!

LES COMPOSANTS IDENTIFIÉS PAR UNE TRAME ET UNE MARQUE  SUR LES DIAGRAMMES SCHÉMATIQUES, LES VUES EXPLOSÉES ET LA LISTE DES PIÈCES SONT CRITIQUES POUR LA SÉCURITÉ DE FONCTIONNEMENT. NE REMPLACER CES COMPOSANTS QUE PAR DES PIÈCES SONY DONT LES NUMÉROS SONT DONNÉS DANS CE MANUEL OU DANS LES SUPPLÉMENTS PUBLIÉS PAR SONY.

**SONY**  
SERVICE MANUAL

# TAE-20F / 20FB

## AMPLIFIER SECTION

### Input:

	Sensitivity	Impedance	Maximum input capability (at 1kHz, 0.01% distortion)	S/N (weighting network)
PHONO with cartridge selector set at MM	-50 dB (2.5 mV)	50 kΩ	-10 dB (250 mV)	85 dB (A)
PHONO with cartridge selector set at MC	-70 dB (0.25 mV)	100 Ω	-32 dB (20 mV)	70 dB (A)
TUNER TAPE AUX	-14 dB (150 mV)	50 kΩ	—	95 dB (A)

### Outputs:

	Output level	Output impedance
REC OUT	150 mV (15 V max.)	10 kΩ
OUTPUT	1 V (15 V max.)	1 kΩ

$$0 \text{ dB} = 0.775 \text{ V}$$

**Headphones:** Load impedance 8 Ω

**Harmonic Distortion:** Less than 0.01 % at rated output

**IM Distortion:**

(60Hz : 7kHz = 4 : 1): Less than 0.03 % at rated output

**Frequency Response:** PHONO

RIAA equalization curve ± 0.3 dB

TUNER, TAPE, AUX

10 Hz – 100 kHz ± 0.5 dB

**Low Filter:** 12 dB/oct. below 20 Hz

**Residual Noise:** Less than 40 µV (A weighting, IHF)

**Tone Controls:** BASS: ± 10 dB at 100 Hz

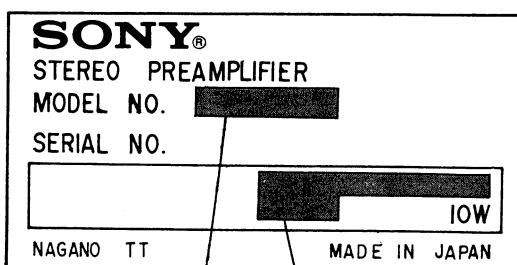
TREBLE: ± 10 dB at 10 kHz

**Loudness Control:**

(att. 30dB): +8 dB at 100 Hz

## MODEL IDENTIFICATION

### Specification Label

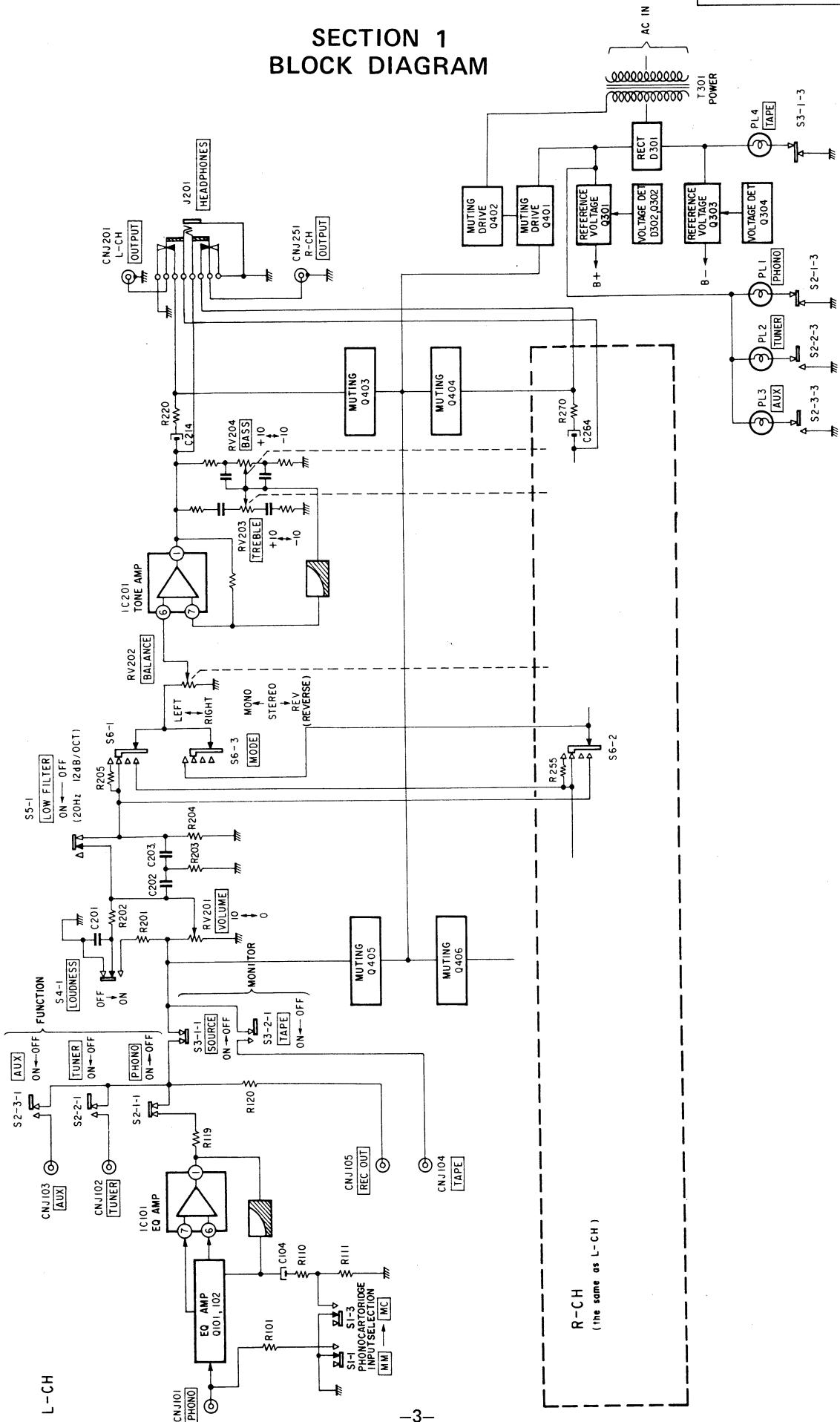


TAE-20F { AC 120V 60Hz. . . . . (US model)  
 AC 220V 50Hz. . . . . (AEP model)  
 AC 120, 220, 240V 50/60Hz. . . . . (E model)  
 AC 240V 50Hz. . . . . (UK model)

TAE-20FB { AC 220V 50Hz. . . . . (AEP model)  
 AC 120V 60Hz. . . . . (Canadian model)

## SECTION 1

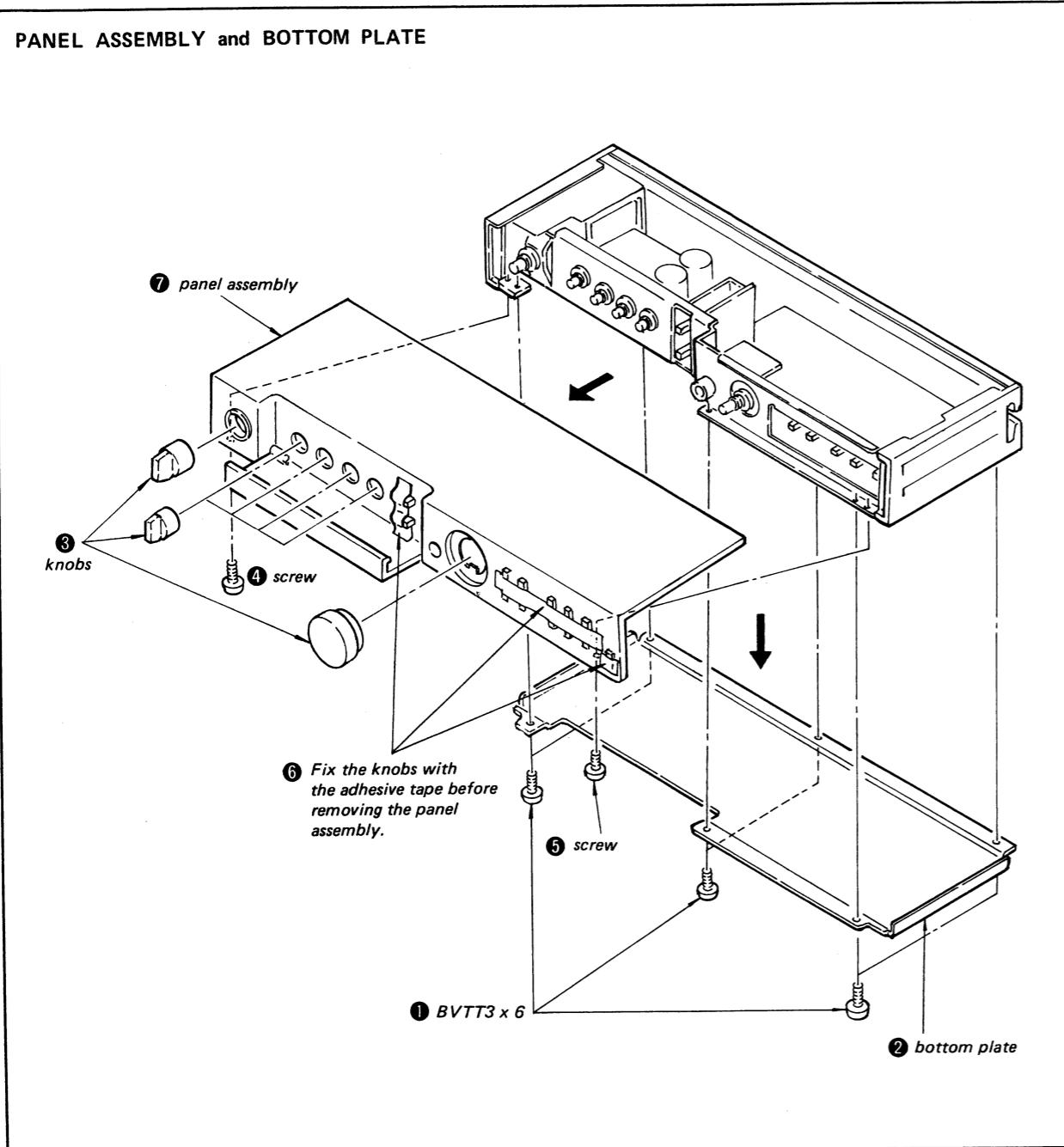
# BLOCK DIAGRAM



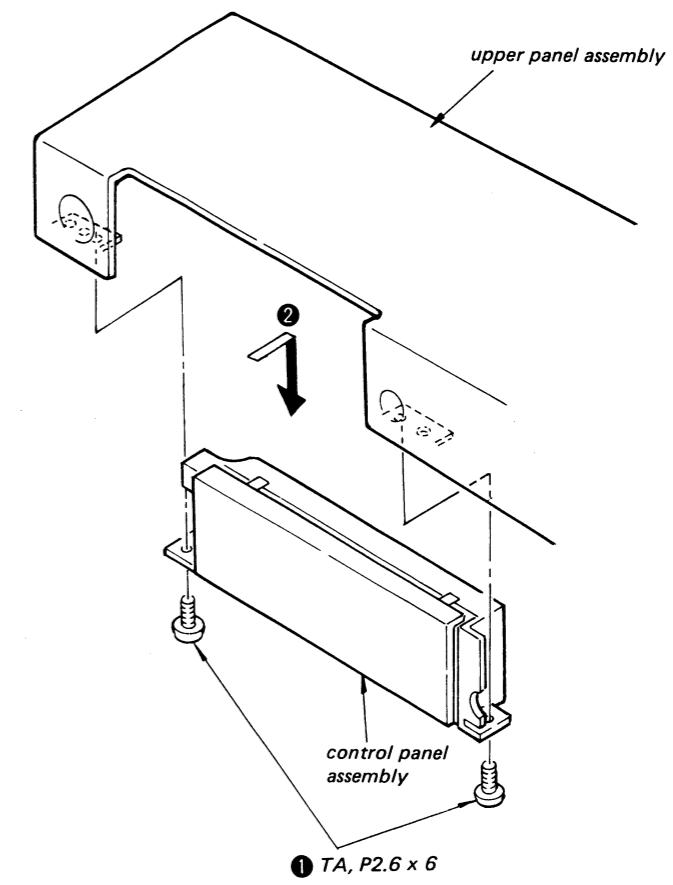
## SECTION 2

### DISASSEMBLY

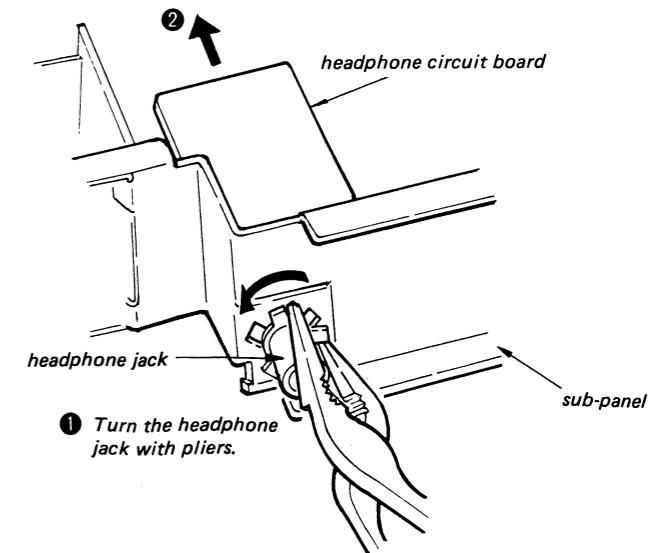
Note: Follow the disassembly procedure in the numerical order given.



#### CONTROL PANEL ASSEMBLY



#### HEADPHONE CIRCUIT BOARD

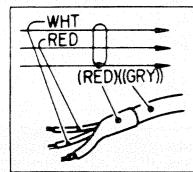


### SECTION 3 DIAGRAMS

#### 3-1. MOUNTING DIAGRAMS – Conductor Side –

##### Note:

- Color code of sleeving over the end of the jacket.



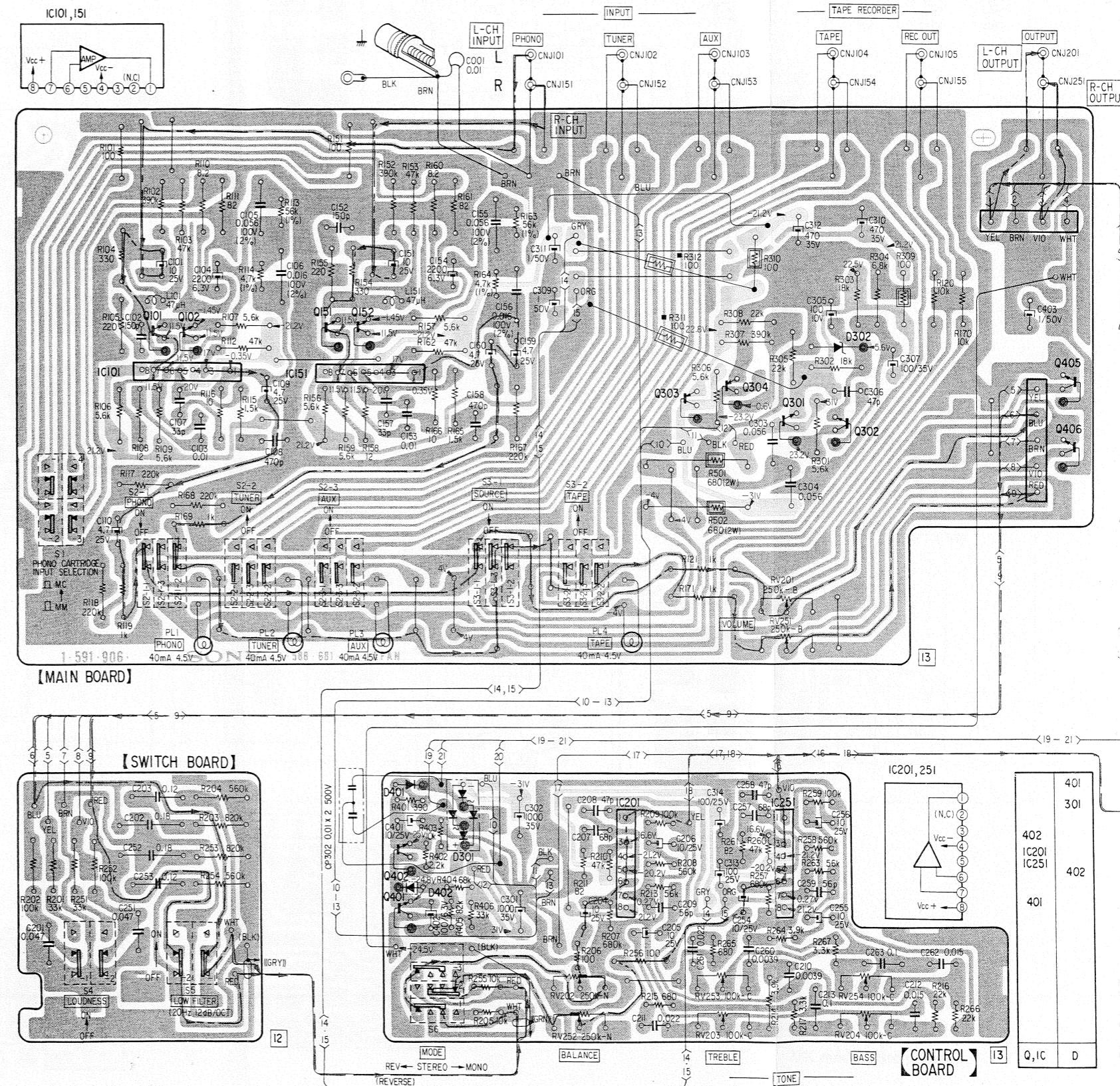
- B+ pattern:** Shaded area on the circuit board.
- B- pattern:** Unshaded area on the circuit board.
- Signal Path:** Indicated by a solid line.
- L-CH:** Indicated by a solid line with a double arrow.
- R-CH:** Indicated by a dashed line with a double arrow.
- All capacitors are in  $\mu$ F unless otherwise noted.  $\mu$ F =  $\mu\mu$ F 50WV or less are not indicated except for electrolytics and tantalum.
- All resistors are in ohms,  $\frac{1}{4}$ W unless otherwise noted.  $k\Omega$  = 1000 $\Omega$ ,  $M\Omega$  = 1000 k $\Omega$ .

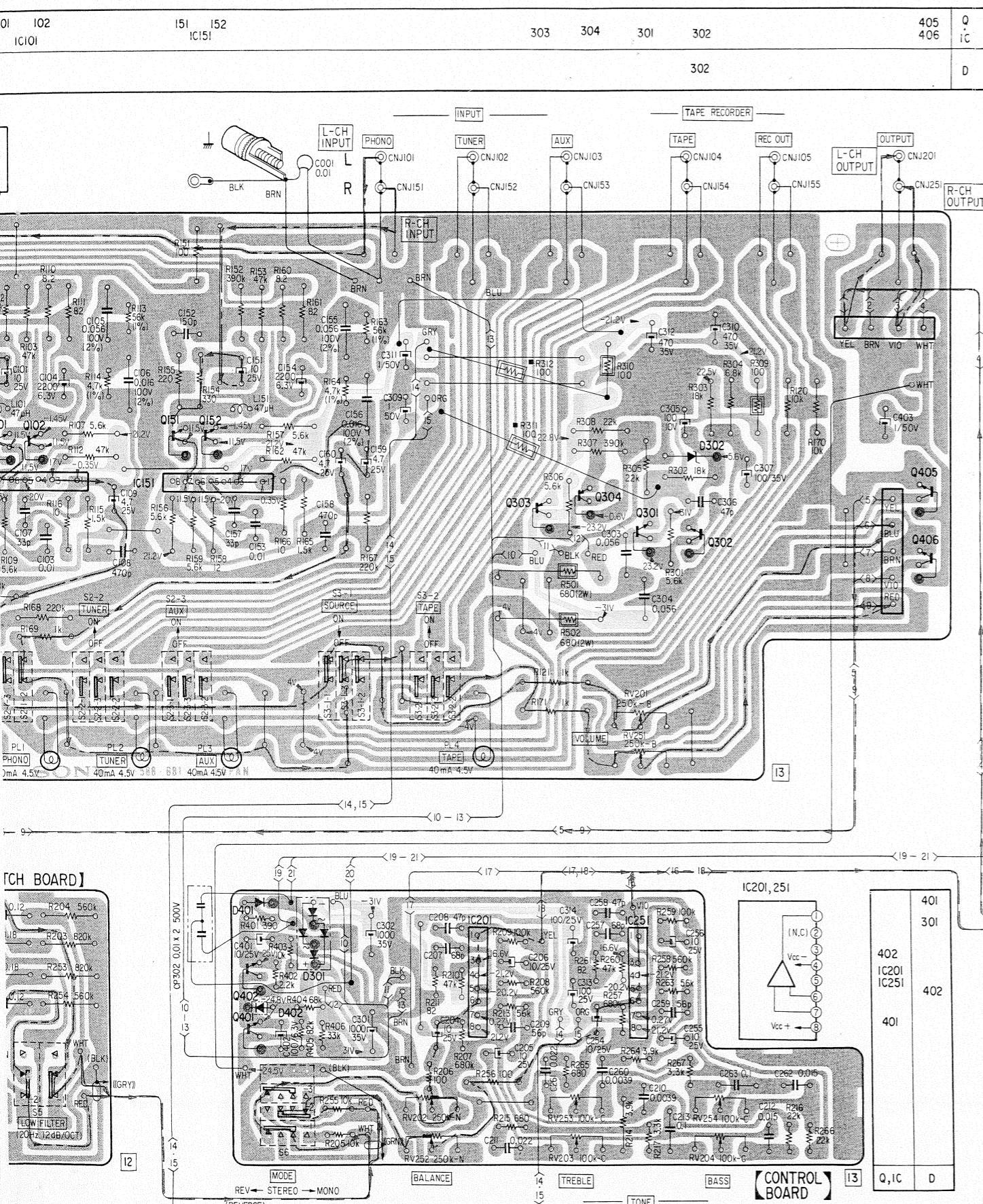
#### Replacement Semiconductors

For replacement, use semiconductors except in ( ).

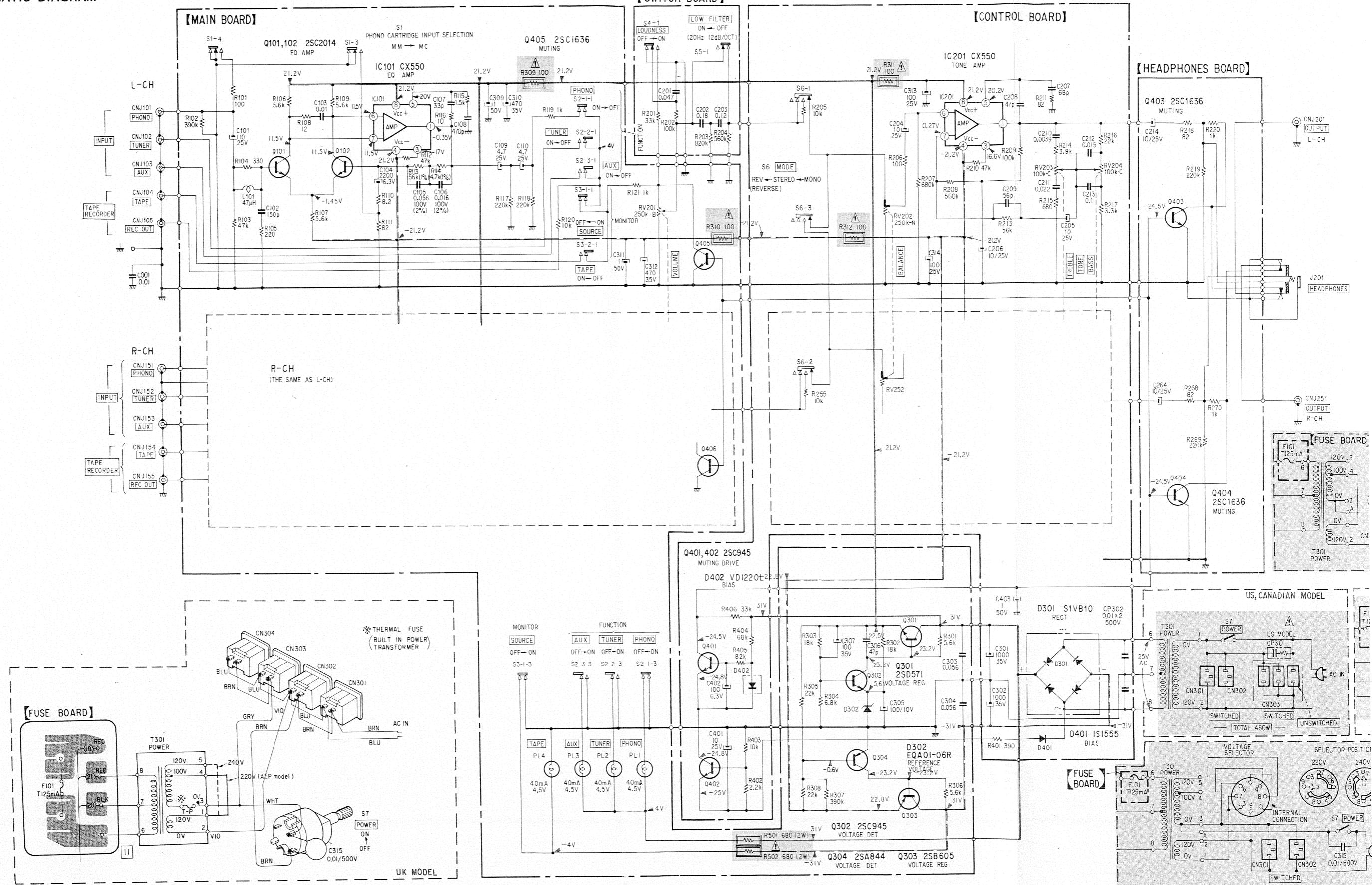
IC101, 151 IC201, 251 : CX550	Q303: 2SB605	D302: RD5.6E (EQA01-06R)
Q101, 151 Q102, 152 : 2SC2014	Q304: 2SA1027R (2SA844)	D401: 1S1555
Q301: 2SC1475 (2SD571)	Q403-406: 2SC1636	D402: VD1220 (VD1220L)
Q302 Q401, 402 : 2SC1364 (2SC945)	D301: S1VB20 (S1VB10)	

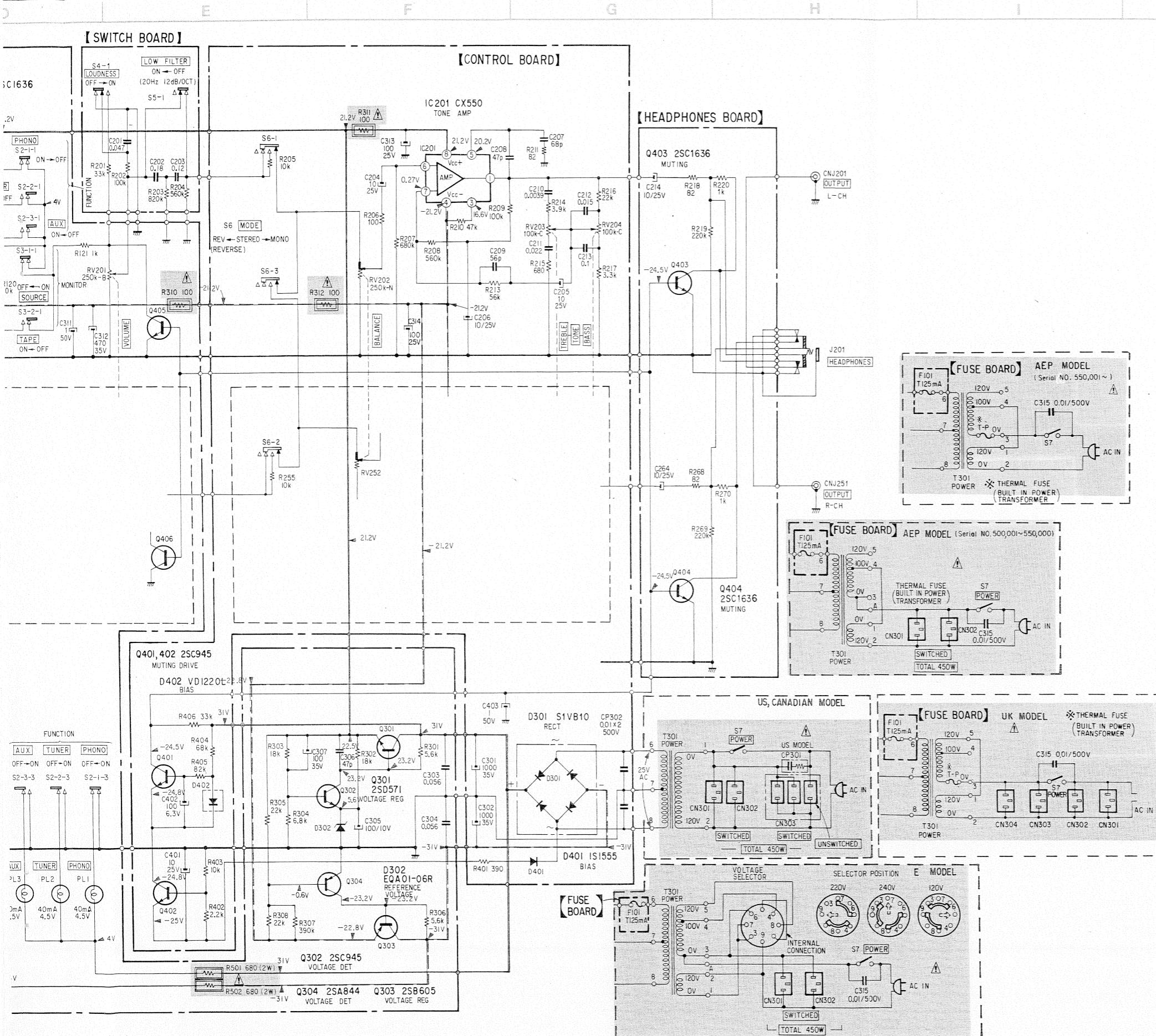
Q IC	101 102 IC101	151 152 IC151	303 304 301 302	405 406 Q IC
D			302	D





### 3-2. SCHEMATIC DIAGRAM





## Note:

- All capacitors are in  $\mu\text{F}$  unless otherwise noted.  $\text{pF}$  :  $\mu\mu\text{F}$
- 50WV or less are not indicated except for electrolytics and tantalum.
- All resistors are in ohms,  $1/4\text{W}$  unless otherwise noted.  $\text{k}\Omega = 1000\Omega$ ,  $\text{M}\Omega = 1000\text{k}\Omega$
- $\triangle$  : nonflammable resistor.
- 1% indicates component tolerance.
- Readings are taken under no-signal conditions with a VOM ( $20\text{k}\Omega/\text{V}$ ).
- Switch

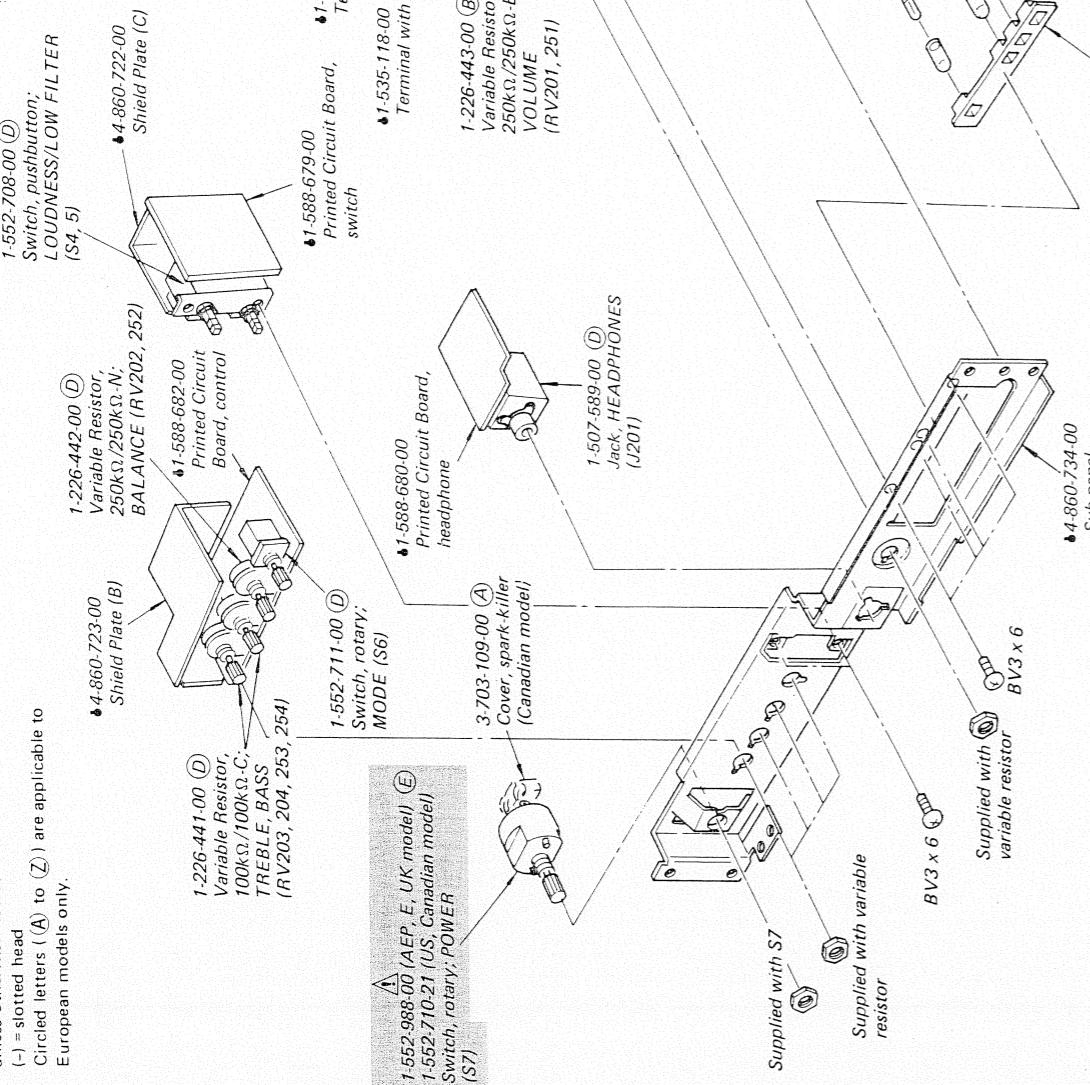
Ref. No.	Switch	Position
S1	PHONO CARTRIDGE INPUT SELECTION	MM
S2	FUNCTION	PHONO
S3	MONITOR	SOURCE
S4	LOUDNESS	OFF
S5	LOW FILTER	OFF
S6	MODE	STEREO
S7	POWER	OFF

Note: The components identified by shading and mark  $\triangle$  are critical for safety. Replace only with part number specified.

Note: Les composants identifiés par une trame et une marque  $\triangle$  sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.



Note:  
 • Items marked "A" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.  
 • All screws are Phillips (cross recess) type unless otherwise noted.  
 (-) = slotted head  
 • Circled letters (A) to (Z) are applicable to European models only.



Note: Les composants identifiés par une trame et une marque A sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

Note: Les composants identifiés par une trame et une marque A sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

Note: Circled letters (A) to (Z) are applicable to European models only.

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description	
<b>SEMICONDUCTORS</b>						
<b>Transistors</b>						
Q101, 151 Q102, 152	8-765-493-00	(D) 2SC2014	C201, 251 C202, 252 C203, 253 C204, 254 C205, 255 C206, 256	1-108-812-00 1-108-364-00 1-108-363-00 1-123-329-00 1-123-329-00	(B) 0.047 (B) 0.18 (B) 0.12 (B) 10 (B) 10	mylar mylar mylar 25V elect
Q301 Q302, 401 Q402 Q303 Q304	8-760-413-10 8-729-663-47 8-729-160-51 8-729-612-77	(D) 2SC1475 (A) 2SC1364 (C) 2SB605 (B) 2SA1027R	C207, 257 C208, 258 C209, 259 C210, 260 C211, 261	1-101-888-00 1-101-880-00 1-101-884-00 1-108-569-00 1-108-808-00	(A) 68p (A) 47p (A) 56p (B) 0.0039 (B) 0.022	mylar mylar
Q403-406	8-761-622-00	(C) 2SC1636	C212, 262 C213, 263 C214, 264	1-108-806-00 1-108-251-00 1-123-329-00	(B) 0.015 (B) 0.1 (B) 10	mylar mylar 25V
IC101, 151 IC201, 251	8-759-305-00	(D) CX550	C301, 302 C303, 304 C305 C306 C307	1-121-945-00 1-108-361-00 1-123-307-00 1-101-880-00 1-123-345-00	(B) 1000 (B) 0.056 (B) 100 (B) 47p (B) 100	35V mylar 10V elect
D301 D302 D401 D402	8-719-511-20 8-719-156-08 8-719-815-55 8-719-122-00	(D) S1VB20 (B) RD5.6E (A) 1S1555 (A) VD1220	C309 C310 C311 C312 C313, 314	1-123-352-00 1-123-348-00 1-123-352-00 1-123-348-00 1-123-333-00	(B) 1 (B) 470 (B) 1 (B) 470 (B) 100	50V 35V 50V 35V 25V
<b>Diodes</b>						
<b>CAPACITORS</b>						
<p>All resistors are in ohms. Common <math>\frac{1}{2}</math>W carbon resistors are omitted. Refer to the list on the last page for their part numbers. p : <math>\mu\mu</math>F, elect : electrolytic</p>						
C001	1-102-129-00	(A) 0.01	C401 C402 C403	1-123-329-00 1-123-295-00 1-123-352-00	(B) 10 (B) 100 (B) 1	25V 6.3V 50V
C101, 151 C102, 152 C103, 153 C104, 154 C105, 155 C106, 156 C107, 157 C108, 158 C109, 159 C110, 160	1-123-329-00 1-101-361-00 1-108-804-00 1-123-300-00 1-130-126-00 1-130-125-00 1-102-963-00 1-102-824-00 1-123-328-00	(B) 10 (A) 150p (B) 0.01 (B) 2200 (B) 0.056 (B) 0.016 (A) 33p (A) 470p (B) 4.7	1-130-196-00 1-221-522-00 1-206-660-00	(D) 0.01 (A) 100 (B) 680	500V (AEP, E, UK model) nonflammable 2W	500V (AEP, E, UK model) nonflammable metal oxide (nonflammable)
<b>RESISTORS</b>						
<p>All resistors are in ohms. Common <math>\frac{1}{2}</math>W carbon resistors are omitted. Check schematic diagram for their values.</p>						
R309, 310 R311, 312 R501, 502	1-226-443-00 1-226-442-00 1-206-660-00	(B) Variable, 250k $\Omega$ /250k $\Omega$ -B; VOLUME (D) Variable, 250k $\Omega$ /250k $\Omega$ -N; BALANCE (D) Variable, 100k/100k-C; TREBLE/BASS				

Note: The components identified by shading and mark A are critical for safety. Replace only with part number specified.

- When sold as a system (GG-20F/20FB)
- ◎ When sold as a unit (TAE-20F)

Note: Circled letters (A to Z) are applicable to European models only.

<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>
<b>COIL</b>		
L101, 151	1-408-164-00	(B) 47 $\mu$ H, microinductor
<b>TRANSFORMERS</b>		
T301	▲1-446-439-00	(K) Power (AEP, E, UK model)
T301	▲1-446-440-00	Power (US, Canadian model)
<b>SWITCHES</b>		
S1	1-552-243-00	(C) Pushbutton, MM/MC
S2	1-552-709-00	(D) Pushbutton, AUX/TUNER/PHONO
S3	1-552-766-00	(C) Key, TAPE/SOURCE
S4, 5	1-552-708-00	(D) Pushbutton, LOUDNESS/LOW FILTER
S6	1-552-711-00	(D) Rotary, MODE
S7	▲1-552-710-00	Rotary, POWER (US, Canadian model)
S7	▲1-552-988-00	(E) Rotary, POWER (AEP, E, UK model)
<b>JACKS</b>		
CNJ101,151	1-507-632-21	(C) PHONO
CNJ102-105	1-507-633-00	(C) TUNER/AUX, TAPE/REC OUT
CNJ152-155	1-507-632-11	(B) OUTPUT
J201	1-507-589-00	(D) HEADPHONES
<b>LAMPS</b>		
PL1-4	1-518-322-21	(B) Pilot, 40mA, 4.5V; TAPE/AUX/TUNER/PHONO
<b>MISCELLANEOUS</b>		
CN301,302	▲1-526-636-00	(E) AC outlet
CN303,304	▲1-526-574-00	AC outlet (US, Canadian model)
CP301	▲1-231-341-00	Spark Killer (US, Canadian model)
CP302	▲1-102-355-00	(B) Encapsulated Component, 0.01 x 2, 500V
F101	▲1-532-149-00	(C) Fuse, T125mA (AEP, E, UK model)

Note: Les composants identifiés par une trame et une marque ▲ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>
	▲1-231-326-11	(B) Encapsulated Component
	▲1-526-576-21	Voltage Selector (E model)
	1-533-131-00	(A) Holder, fuse (AEP, E, UK model)
	▲1-534-817-XX	(E) Cord, power (AEP model)
	▲1-534-986-XX	Cord, power; parallel-blade plug (E model)
	●1-535-117-00	Terminal with base, 4P
	●1-535-118-00	Terminal with base, 5P
	▲1-551-511-00	Cord, power (US, Canadian model)
	▲1-551-530-00	(D) Cord, power; euro-plug (E model)
	▲1-555-001-00	Cord, power (UK model)
	●1-588-679-00	Printed Circuit Board, switch
	●1-588-680-00	Printed Circuit Board, headphone
	●1-588-681-00	Printed Circuit Board, main
	●1-588-682-00	Printed Circuit Board, control
<b>ACCESSORIES AND PACKING MATERIALS</b>		
<u>Part No.</u>	<u>Description</u>	
◎1-551-734-11	Cord, connection; (RK-74A) (TAE-20F) (AEP, UK model)	
◎1-551-708-00	Cord, connection (TAE-20F) (AEP model)	
3-770-682-21	(D) Manual, instruction; English	
3-770-682-31	(I) Manual, instruction; French	
3-770-682-51	(I) Manual, instruction; Spanish (GG-20F)	
3-770-683-11	(I) Manual, instruction; GG-10F/10FB (AEP model)	
●3-770-683-21	Manual, instruction; GG-10F (US model)	
3-770-683-51	Manual, instruction; GG-10F (E model)	
◎3-783-249-11	Manual, instruction (TAE-20F) (AEP, UK model)	
4-860-646-00	(A) Sheet, protection	
4-860-648-00	(C) Cushion	
●4-860-743-00	(J) Carton, TAE-20F	
4-860-744-00	(J) Carton, TAE-20FB	
◎4-860-769-00	Carton (TAE-20F) (AEP, UK model)	

- Items marked “●” are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

Note: The components identified by shading and mark ▲ are critical for safety. Replace only with part number specified.

## 1/4 WATT CARBON RESISTORS A

Note: Circled letter A is applicable to European models only.

Ω	Part No.	Ω	Part No.	Ω	Part No.	Ω	Part No.	Ω	Part No.	Ω	Part No.	Ω	Part No.
1.0	1-246-401-00	10	1-246-425-00	100	1-246-449-00	1.0k	1-246-473-00	10k	1-246-497-00	100k	1-246-521-00	1.0M	1-246-545-00
1.1	1-246-402-00	11	1-246-426-00	110	1-246-450-00	1.1k	1-246-474-00	11k	1-246-498-00	110k	1-246-522-00	1.1M	1-210-814-00
1.2	1-246-403-00	12	1-246-427-00	120	1-246-451-00	1.2k	1-246-475-00	12k	1-246-499-00	120k	1-246-523-00	1.2M	1-210-815-00
1.3	1-246-404-00	13	1-246-428-00	130	1-246-452-00	1.3k	1-246-576-00	13k	1-246-500-00	130k	1-246-524-00	1.3M	1-210-816-00
1.5	1-246-405-00	15	1-246-429-00	150	1-246-453-00	1.5k	1-246-577-00	15k	1-246-501-00	150k	1-246-525-00	1.5M	1-210-817-00
1.6	1-246-406-00	16	1-246-430-00	160	1-246-454-00	1.6k	1-246-578-00	16k	1-246-502-00	160k	1-246-526-00	1.6M	1-210-818-00
1.8	1-246-407-00	18	1-246-431-00	180	1-246-455-00	1.8k	1-246-579-00	18k	1-246-503-00	180k	1-246-527-00	1.8M	1-210-819-00
2.0	1-246-408-00	20	1-246-432-00	200	1-246-456-00	2.0k	1-246-580-00	20k	1-246-504-00	200k	1-246-528-00	2.0M	1-210-820-00
2.2	1-246-409-00	22	1-246-433-00	220	1-246-457-00	2.2k	1-246-581-00	22k	1-246-505-00	220k	1-246-529-00	2.2M	1-210-821-00
2.4	1-246-410-00	24	1-246-434-00	240	1-246-458-00	2.4k	1-246-582-00	24k	1-246-506-00	240k	1-246-530-00	2.4M	1-244-754-00
2.7	1-246-411-00	27	1-246-435-00	270	1-246-459-00	2.7k	1-246-583-00	27k	1-246-507-00	270k	1-246-531-00	2.7M	1-244-755-00
3.0	1-246-412-00	30	1-246-436-00	300	1-246-460-00	3.0k	1-246-584-00	30k	1-246-508-00	300k	1-246-532-00	3.0M	1-244-756-00
3.3	1-246-413-00	33	1-246-437-00	330	1-246-461-00	3.3k	1-246-585-00	33k	1-246-509-00	330k	1-246-533-00	3.3M	1-244-757-00
3.6	1-246-414-00	36	1-246-438-00	360	1-246-462-00	3.6k	1-246-586-00	36k	1-246-510-00	360k	1-246-534-00	3.6M	1-244-758-00
3.9	1-246-415-00	39	1-246-439-00	390	1-246-463-00	3.9k	1-246-587-00	39k	1-246-511-00	390k	1-246-535-00	3.9M	1-244-759-00
4.3	1-246-416-00	43	1-246-440-00	430	1-246-464-00	4.3k	1-246-488-00	43k	1-246-512-00	430k	1-246-536-00	4.3M	1-244-760-00
4.7	1-246-417-00	47	1-246-441-00	470	1-246-465-00	4.7k	1-246-489-00	47k	1-246-513-00	470k	1-246-537-00	4.7M	1-244-761-00
5.1	1-246-418-00	51	1-246-442-00	510	1-246-466-00	5.1k	1-246-490-00	51k	1-246-514-00	510k	1-246-538-00	5.1M	1-244-762-00
5.6	1-246-419-00	56	1-246-443-00	560	1-246-467-00	5.6k	1-246-491-00	56k	1-246-515-00	560k	1-246-539-00		
6.2	1-246-420-00	62	1-246-444-00	620	1-246-468-00	6.2k	1-246-492-00	62k	1-246-516-00	620k	1-246-540-00		
6.8	1-246-421-00	68	1-246-445-00	680	1-246-469-00	6.8k	1-246-493-00	68k	1-246-517-00	680k	1-246-541-00		
7.5	1-246-422-00	75	1-246-446-00	750	1-246-470-00	7.5k	1-246-494-00	75k	1-246-518-00	750k	1-246-542-00		
8.2	1-246-423-00	82	1-246-447-00	820	1-246-471-00	8.2k	1-246-495-00	82k	1-246-519-00	820k	1-246-543-00		
9.1	1-246-424-00	91	1-246-448-00	910	1-246-472-00	9.1k	1-246-496-00	91k	1-246-520-00	910k	1-246-544-00		

## HARDWARE NOMENCLATURE

Screw:



Indicated slotted-head only.

Unless otherwise indicated, it means cross-recessed head (Phillips type).

Nut, Washer, Retaining ring:



Diameter of usable screw or shaft  
Reference designation

Reference Designation	Shape	Description	Remarks
SCREWS			
P		pan-head screw	binding-head (B) screw for replacement
PWH		pan-head screw with washer face	binding-head (B) screw and flat washer for replacement
PS PSP		pan-head screw with spring washer	binding-head (B) screw and spring washer for replacement
PSW PSPW		pan-head screw with spring and flat washers	binding-head (B) screw and spring and flat washers for replacement
R		round-head screw	binding-head (B) screw for replacement
K		flat-countersunk-head screw	
RK		oval-countersunk-head screw	
B		binding-head screw	
T		truss-head screw	binding-head (B) screw for replacement
F		flat-fillister-head screw	
RF		fillister-head screw	
BV		braizer-head screw	

Reference Designation	Shape	Description	Remarks
SELF-TAPPING SCREWS			
TA		self-tapping screw	ex: TA, P 3 x 10
PTP		pan-head self-tapping screw	binding-head self-tapping (TA, B) screw for replacement
PTPWH		pan-head self-tapping screw with washer face	binding-head self-tapping (TA, B) screw and flat washer for replacement
PTTWH		pan-head thread-rolling screw with washer face	binding-head (B) screw and flat washer for replacement
SET SCREWS			
SC		set screw	
SC		hexagon-socket set screw	ex: SC 2.6 x 4, hexagon socket
NUT			
N		nut	
WASHERS			
W		flat washer	
SW		spring washer	
LW		internal-tooth lock washer	ex: LW3, internal
LW		external-tooth lock washer	ex: LW3, external
RETAINING RINGS			
E		retaining ring	
G		grip-type retaining ring	

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